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THE RELATION OF BUSINESS TO COLLEGE EDUCATION.

THE question of the benefit and advantage of a college education in relation to business was some time ago freely discussed in some of our leading magazines. Many of the articles were not without a grain of truth, yet in some of them the authors seemed to disregard certain essential questions.

It is not the purpose so much of higher education to fill the mind with knowledge as it is to discipline and develop the mind, and it is not so much the object of the college to make professional men as it is to prepare the student for a professional career.

An inquiry into the psychical constitution of normal beings will show some marked general characteristics. For example, some possess great executive powers associated with marked powers of application and execution; others possess great reflective powers associated with slight powers of execution and little or no executive ability; and others again may possess all these powers equally strong, or they may be variously combined in individuals as to degree and quality. The intention is not to enumerate any more characteristics than such general ones as come into use in business. All these powers admit only of a certain degree of development.

It is conceded that every normal being is endowed with certain natural abilities to acquire knowledge. The degree of the development of these abilities and the direction in which they run are often difficult to determine; and here it is where the largest number and most serious mistakes are made. Every individual, no matter what his abilities are, must receive a certain amount of training and education, and these may come to him in one form or another, either practical, theoretical, or both. The acquisition of knowledge through personal experience alone will prove both good and bad, and it is through a theoretical training and education that the bad may be avoided. In discriminating between all the degrees of natural abilities supplemented with practical training and natural abilities supplemented with book learning, an important element will be found which can only be acquired through systematic book training and proper schooling, and that is discipline. Discipline gives discriminating powers and quickness to the perception, lends accuracy to the conception, aids the reason to draw proper conclusions from a series of facts, and thereby sharpens the judgment, develops the memory, controls the will, and subjects the emotions. In connection with this, the attention may be called to the fact that a methodical mind is not always a well disciplined mind.

Again, there is a distinguishing element common only to natural ability, and which does not depend upon knowledge alone or any higher psychical organization called knack. This is generally noticeable in powers of execution. For example, if we observe a number of mechanics working at the same job, it will appear that a few of them show exceptional facility in the execution of their work, while others with all their training and practice cannot attain this facility. The degree of difference in the work may not be great, yet it is noticeable; and the man who is the happy possessor of this particular gift is the man most sought for.

A comparison of various individuals within the different classes in which men may be classified from the standpoint of vocation will show similar results. As an illustration we need only to take two orators. Suppose them as nearly as

possible to be equally equipped mentally, morally, and physically, yet when addressing an assembly there will be seen a marked difference in the effect produced upon the audience. To the one they will listen with indifference; to the other they will appear as if they drank in every word that fell from his lips. So again, if two orators unequal in education and training address an audience, it is not infrequent that the one possessed of the lesser education and training will hold his audience spell-bound, while the other will leave his audience cold and unaffected. The question will now arise, To what can this difference be attributed? The solution undoubtedly lies in the peculiar, fascinating influence exercised over the listeners through the method, the style. It is this which inspires truthfulness, conviction, and confidence, and may be considered a quality of executive ability. In every vocation of life we may trace this quality as essential to success. The author, the poet, the lawyer, the actor, the politician, the merchant—all of whatever class will profit by possessing this quality. True, this quality may be developed to a limited extent, yet the possessor of it by nature need have hardly any schooling or training, and he will succeed.

The questions, which will now present themselves for consideration, are, Why is it that so many men of very inferior mental capacity and in some instances of marked natural ability, though uneducated, are so successful in accumulating large fortunes, and why is it that so few college-bred men are successful in the commercial world and become possessors of large fortunes?

It is not infrequent where men equally equipped mentally, either educated or uneducated, start out in the world both having the same habits of thrift and economy, of industry and energy, of perseverance and endurance, and both having equally good opportunities for making money, that one of them succeeds in accumulating a large fortune, while the other gets along but moderately. The statement is quite generally admitted that a person who is economical, prompt, reliable, honest, and accommodates himself to the circumstances, and does not meet with any misfortune, may acquire sufficient means to live fairly well, but to acquire a large fortune something more is requisite.

To what this difference may be ascribed is the question. Surely, it cannot be maintained that one has more brains than the other or that he possesses better advantage by whatever means, for the assumption is that they are equal in these respects. Then the only factor to which this can be attributed is unquestionably the style or peculiar influence they exercise over others, and by which they inspire confidence and enlarge their circle of patrons. As an argument in favor of this view a reference to cases where men are totally unworthy of confidence needs only to be made. How often does it happen that men morally perverted are capable of inspiring confidence in people, and this not only in the unwary and ignorant but in men of brains and education. How often do men of inferior intellect exercise much influence among the educated and ignorant. To attribute this to any other power than the peculiar fascinating influence that many men have over others is absurd. The average business man, however great his success may be, and who has received no college training, is narrow, emotional, exacting, and will often resort to means in accomplishing his purposes which a college educated man would hesitate to do, and most college-bred men of this stamp will possess these traits inherently.

That the school of experience quickens self-reliance, that

it gives positiveness to one's opinions and conduct, that one more readily forms his final conclusions from first impressions, and that a well disciplined mind might avert many sad experiences, which an undisciplined mind is obliged to go through, is undisputed. That the college graduate has many edges to round off when he enters upon the struggle for existence is manifest. During his entire college course he has only heard of the highest standards of the intellect and of morality. Although he has been taught to deal with things as they are, yet a large portion of his instruction has been devoted to things as they should be; and therefore when he starts in life he must adjust himself to life as it is. Whether this is a fault in that the training is not held within the limits of the practical may be an open question. But on the other hand, that a college education has the tendency to make one more humane, to broaden one's views of life, to make one more liberal, to quicken one's perception, to lend accuracy to the judgment, and insure more logical thinking, cannot be denied.

FRANKLIN A. BECHER.

THE SYSTEM OF ALGOL.¹

THE steady advance of exploratory research in the system of Algol promises to furnish one of the most curious and instructive episodes in the history of science. Vague hypothesis, determinate theory, and triumphant verification have already played their logically sequent parts in the discovery of the eclipsing satellite. Goodricke's conjecture, however, had to wait nearly a century for Pickering's formulization, while this was ratified within a decade by Vogel's disclosure of the anticipated tell-tale spectroscopic effects.

Progress has, indeed, of late notably quickened its pace; and we may therefore hope for a prompt and effective application of the Ithuriel-spear of adapted observation to the latest creation of speculative intelligence in the lately organized department of "dark stars." Since Argelander's time it has been tolerably evident that Algol had other attendants besides the agent in producing its periodical eclipses. For their recurrence was shown by him to be subject to minute irregularities in point of time, and these irregularities are of such a nature as to demand for their explanation the presence of at least one disturbing mass. A highly complex piece of mechanism could plainly be seen to be at work; yet the penetration of its intricacies presented a task so formidable that astronomers of, at any rate, the present generation might well have despaired of its accomplishment. It has, nevertheless, been undertaken by Dr. Chandler, and his labors have been rewarded with an encouraging measure of success.²

They have been necessarily of a more or less tentative character, and their result must be looked upon as merely provisional; but there is much reason to suppose that it at least approximates to the truth. It is, moreover, perfectly plain and straightforward; there is nothing of the *obscurum per obscurius* about it; the consequences it involves are definite, and admit of definite verification.

The new and enticing hypothesis now presented for the consideration of astronomers is mainly founded upon certain well-ascertained inequalities in Algol's period of variation. These were shown by Dr. Chandler's discussion some little time since³ to be slowly compensatory. They are oscillatory, not progressive. Consistently in advance of their due time down to about the year 1804, the obscurations of the star

then began to fall behind it, and the delay had accumulated in 1843 to 165 minutes. A gradual process of restoration thereupon set in, and the normal epoch was reached near the beginning of 1873. It was quickly, however, transcended, for acceleration is still going forward, and is likely to continue operative during some years to come.

These irregularities are evidently comprised in a cycle considerably exceeding one hundred years, and for that very reason it is difficult to account for them on gravitational principles; since a third body, exterior to the close pair, should, in order to produce any marked perturbational effects, revolve much nearer to them than would be consistent with so long a period. Another mode of explanation is, accordingly, resorted to by Dr. Chandler. The varying intervals needed for the transmission of light from different parts of a large orbit described by Algol and its dark satellite round a remote primary, are, in his view, the fundamental cause of the alternate anticipations and retardations in the occurrence of Algol's eclipses. They are, in fact, apparently shifted backwards and forwards in time, just in the same way as are the eclipses of Jupiter's satellites through the orbital movement of the earth. Algol may, then, be regarded as the solitary luminous number of a multiple combination of opaque masses. The common centre of gravity, round which the pair hitherto known revolves in a period of about 131 years, lies by the present hypothesis at a distance from it just equal to that of Uranus from the sun. The path thus traced out is, we are further informed, sensibly circular, and its plane is inclined 20° to our line of vision. Obviously, however, during the whole time occupied in travelling over its remoter half, the light-minima of the star must be recorded somewhat later than if we saw them in the precise order of their actual occurrence; and this remoter half was swept over between the years 1804 and 1869, when the observed phases were always in arrear of calculation. Now, on the other hand, that the star is on the hither side of its orbit, the epochs of its eclipses are apparently anticipated, and will not coincide with their true times until the passage of the "ascending node," about 1934. The dimensions of Algol's orbit, with its inclination, of course prescribe the amplitude of the oscillations by which its periodicity appears to be disturbed; and this "light-equation," as we may call it, proves to be 149 minutes. This should be the maximum extent, whether of acceleration or of retardation; but in point of fact, as we have seen, delay mounted up in 1843 to 165 minutes. Hence the theory cannot be said to represent the observations as satisfactorily as could be desired. The deviations, indeed, are large enough to suggest to Dr. Chandler further complications, the unravelment of which may challenge the utmost skill and patience of investigators. Meantime, a touchstone of the general truth of his hypothesis will soon be at hand; for it involves a cessation within the next ten or twelve years, and a subsequent reversal of the shortening process at present affecting the star's period of luminous change; and the fulfilment of this prediction will serve as a hall-mark of its genuine quality. An additional test may be derived from the spectrographic evidence. The velocity of Algol in the large orbit attributed to it is 2.7 miles per second; but of this, less than one-half, or about one mile per second, is at present directed towards the earth. It constitutes, however, a goodly proportion of the 2.3 miles of continuous approach determined from the Potsdam plates; but which should in the course of a score of years, if the new theory be true, completely disappear, neutralized by the altered direction of the star's orbital motion. It remains,

¹ From Knowledge for May.

² *Astronomical Journal*, Nos. 255, 256.

³ *Ibid.*, vol. vii., pp. 165-183.